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ABSTRACT

Instructional objectives and performance requirements are outlined in this course guide for Welding II, a performance-based course offered at the Community College of Allegheny County to introduce students to out-of-position shielded arc welding with emphasis on proper heats, electrode selection, and alternating/direct currents. After introductory material outlining course objectives, texts, and the materials needed by students in class, the guide lists course standards of achievement in eight evaluation areas: the proper size of stringer beads and fillet welds, starting a weld, uniform flux lines, tie-ins, ending a weld, undercutting, excessive spatter, and proper cleaning during and after welding. An outline of topics, activities, and tests to be covered during each of the 16 weeks in the semester is then presented, followed by illustrations of satisfactory welding task plates against which student performance can be measured. Finally, the guide presents objectives and instructions for each of the 17 performance tasks and three written tests which form the basis of student evaluation. Grading standards and the forms to be used in keeping student records are appended. (JP)

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ED194131

COMMUNITY COLLEGE OF ALLEGHENY COUNTY

CENTER-NORTH

WELDING II
72102

3 Credits/2 Lectures/3 Labs

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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COMMUNITY COLLEGE OF ALLEGHENY COUNTY

CENTER-NORTH

WELDING II
72102

3 Credits/ 2 Lectures/ 3 Labs

I. DESCRIPTION

This course will concentrate on out-of-position shielded metal arc welding with emphasis on proper heats, electrode selections, and AC/DC currents. Welding positions include: horizontal, vertical and overhead, and a second course in oxy-acetylene flame cutting.

Prerequisite: 72101 Welding I or by permission of instructor.

II. OBJECTIVES

A. The student should complete what objectives were set in Welding I, as they are important in the continuation of Welding II.

B. The student should be able to produce welds out-of-position using various electrodes.

C. The student should be able to apply various electrode manipulation techniques used with different type electrodes.

D. The student should be able to expand his/her knowledge on the theory of Arc Welding and its related processes.

E. The student should be preparing himself/herself for the coming objectives set up in Welding III.

III. TEXTBOOK

A. Welding Skills and Practices; Giachino, Weeks.

IV. MATERIALS NEEDED BY STUDENTS

A. Welding Helmet (Flip lens)
B. Welding Gloves
C. Proper Protective Clothing
D. Leather Jacket and Sleeves
E. Pliers

V. SUPPLEMENTARY TEXTS

A. Pocket Welding Guide; Hobart Brothers
B. Complete Welding Library; Media Center (Library)
C. Handouts on Welding, Cutting, and Safety. Supplied by the instructor.

VI. STANDARDS OF ACHIEVEMENT

A. Competencies

Seventeen (17) performance-welding tasks performed by students and graded visually by the welding instructor. (See duties and tasks)

Criterion For Evaluation of Competencies (checked by the instructor)

AREA OF EVALUATION	WHAT I AM LOOKING FOR
1. Size of welds	
a. Stringer beads	Height and Width
b. Fillet welds	Size of legs, contour of weld face
2. Starting a weld	Height and width same as rest of weld
3. Uniform flux lines	Even spacing and round shape
4. Tie-ins	Restarting a weld in a crater
5. End of weld	Proper filling of a crater at the end of the weld
6. Undercut	Groove at toes of weld
7. Excessive spatter	Small balls of metal and slag around weld area
8. Dirty welds	Improper cleaning during and after welding

B. Written tests (2) -- consisting of:

a. Multiple choice
b. True and false
c. Essay
d. Written tests scheduled throughout the semester including the final exam.

C. Grading -- See Standards of Achievement and Grading

1. Upon satisfactory completion of all performance tests and written examinations, the student is assigned a letter grade (see appendix).

2. If the student does not satisfactorily complete the performance tests and written examinations, a grade of "I" (Incomplete) is assigned and the student should be encouraged to register again for Welding II the following semester.

NOTICE TO INSTRUCTORS:

These chapters on theory and practical application are to be covered during the course. The sequence above is suggested. Changes in the sequence in which it is presented are at the discretion of the instructor to compensate for class size and/or equipment availability.

Explanation of headings under Topic Outline (Page 4)

WEEK:

The Topic Outline is set up for a 16-week course.

PAT CASSETTE TOPIC:

This is programmed Audio-Visual Training, by Hobart. Projector and cassettes are located in the instructors cabinet. 16 MM movies are located in the Media Center. You must give five (5) days notice to reserve for showing.

CLASS TOPIC:

Instructor and student objectives

ELECTRODE SIZE/TYPE:

To be used in relation to the class topic.

PERFORMANCE PLATES:

These are welding test plates performed by the student and graded visually by the instructor. (Pictures of finished plates included)

CHAPTER ASSIGNMENT:

The assignments should be given to the student a week in advance for study.

TEXT:

Welding Skills & Practices

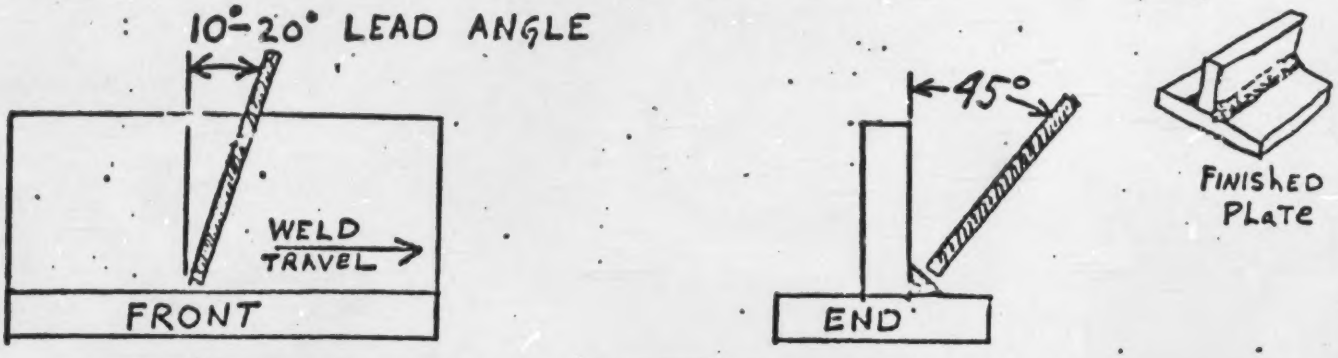
WELDING II

72102

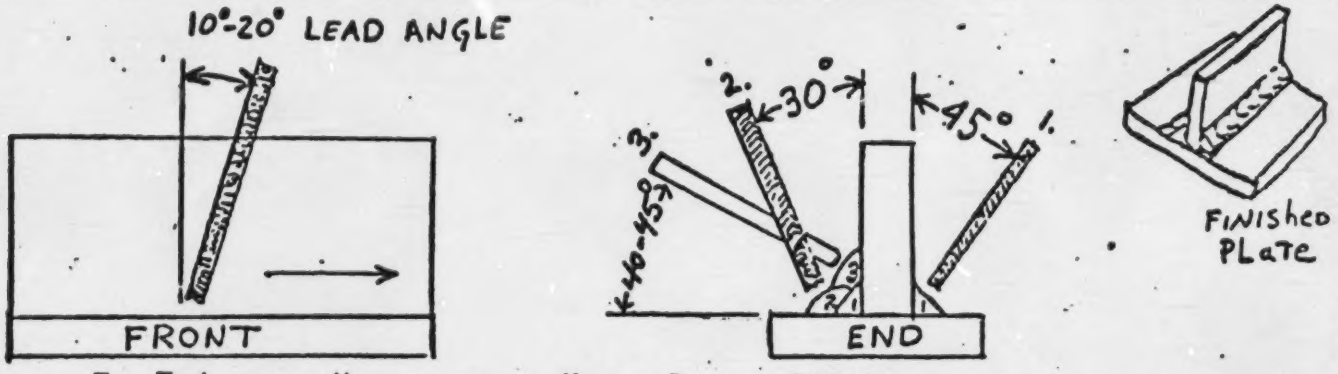
TOPIC OUTLINE

Week	PAT Cassette Topic	Class Topic	Electrode Size/Type	Performance Objectives	Chapter Assignment
1		Orientation Safety Course Outline			10
2	6	T-Joint - Fit - Tack	E6010	1	11
		T-Joint - Horizontal Stringer Beads	E6010	2	
	8	T-Joint - Horizontal Multi-Pass	E6010	3	
3		Plate - Vertical - Stringer Beads	E6010	4	11
4	15	T-Joint - Vertical - Stringer Beads	E6010	5	11
5		T-Joint - Vertical - Multi-Pass	E6010	6	12
6		Plate - Overhead - Stringer Beads	E6010	7	
	19	T-Joint - Overhead - Stringer Beads	E6010	8	
7		T-Joint - Overhead - Multi-Pass	E6010	9	
		Quiz 1 (written test)			
8	29	T-Joint - Horizontal - Stringer Beads	E7018	10	
9		T-Joint - Horizontal - Multi-Pass	E7018	11	
10		Plate - Vertical - Stringer Beads	E7018	12	
11	30	T-Joint - Vertical - Stringer Beads	E7018	13	
12		T-Joint - Vertical - Multi-Pass	E7018	14	
13		Plate - Overhead - Stringer Beads	E7018	15	

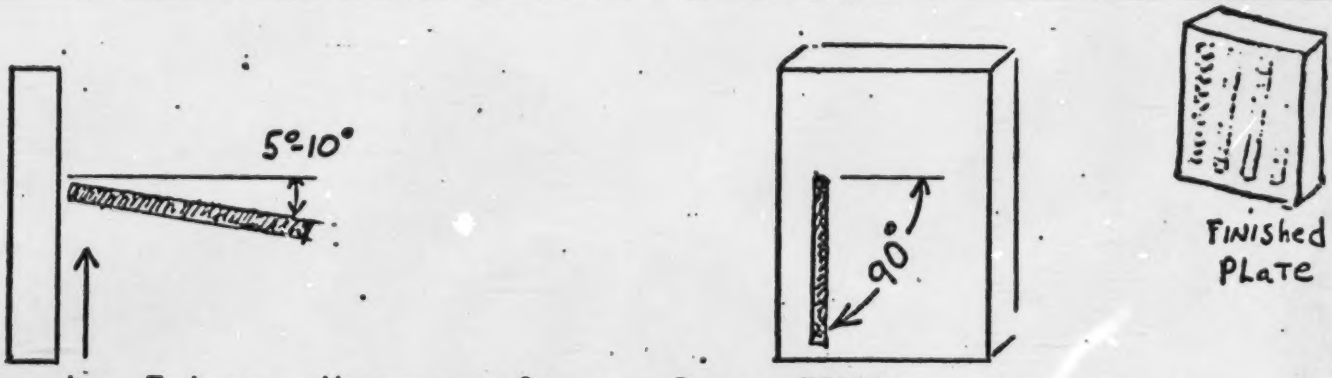
Week	PAT Cassette Topic	Class Topic	Electrode Size/Type	Performance Objectives	Chapter Assignment
14	31	T-Joint - Overhead - Stringer Beads	E7018	16	
15		T-Joint - Overhead - Multi-Pass	E7018	17	
16		Quiz 2, written test (Final)			



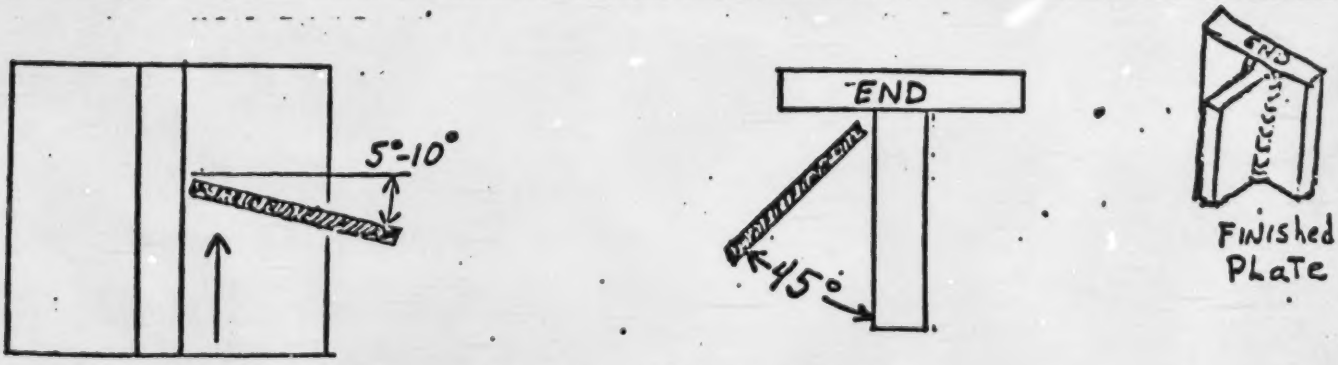
2. T-JOINT - HORIZONTAL - STRINGER BEAD - E6010



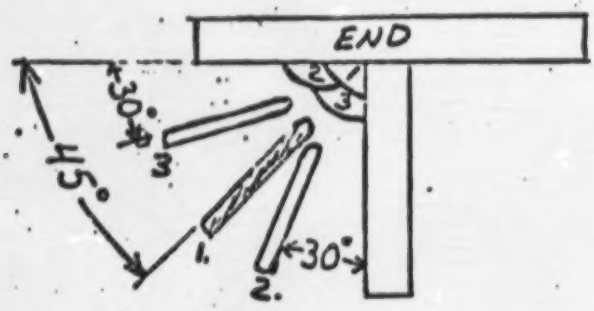
3. T-JOINT - HORIZONTAL - MULTI-PASS - E6010

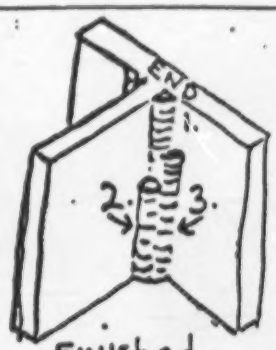


4. T-JOINT - VERTICAL - STRINGER BEAD - E6010

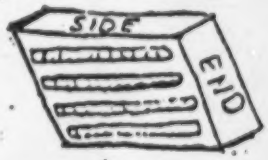


5. T-JOINT - VERTICAL - STRINGER BEAD - E6010

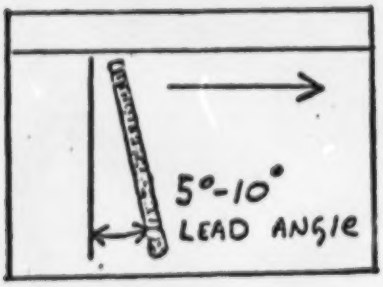


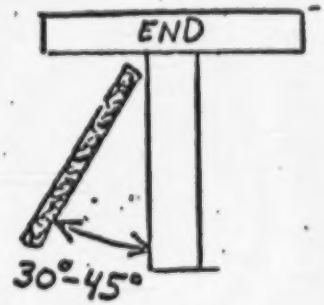


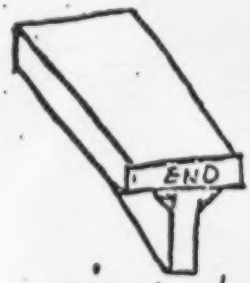
6. T-JOINT - VERTICAL - MULTI-PASS - E6010



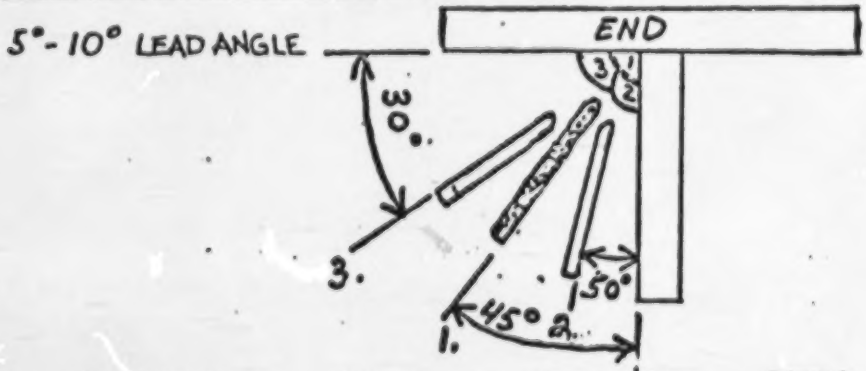
7. PLATE - OVERHEAD - STRINGER BEAD - E6010







8. T-JOINT - OVERHEAD - STRINGER BEAD - E6010



9. T-JOINT - OVERHEAD - MULTI-PASS - E6010

SAME AS PLATE 1

10. T-JOINT - HORIZONTAL - STRINGER BEADS - E7018

SAME AS PLATE 2

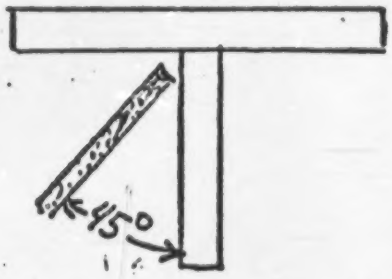
11. T-JOINT - HORIZONTAL - MULTI-PASS - E7018

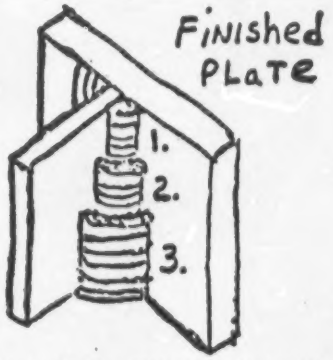
SAME AS PLATE 3

12. PLATE - VERTICAL - STRINGER BEADS - E7018

SAME AS PLATE 4

13. T-JOINT - VERTICAL - STRINGER BEAD - E7018





14. T-JOINT - VERTICAL - MULTI-PASS - E7018

SAME AS PLATE 6

15. PLATE - OVERHEAD - STRINGER BEADS - E7018

SAME AS PLATE 7

16. T-JOINT - OVERHEAD - STRINGER BEAD - E7018

SAME AS PLATE 8

17. T-JOINT - OVERHEAD - MULTI-PASS - E7013

DUTIES & TASKS

DUTIES & TASKS

A supply of the Competency Based Duties & Tasks are available in each welding laboratory.

The instructor should issue the duties & tasks to the student as he progresses through the course so that the student knows exactly what he is to do and how his performance will be evaluated.

WELDING II

DUTY: Operating Shielded Metallic Arc Welding Equipment

TASK: Set Up and Tack Plates For T-Joint In The Horizontal Position Using E-6010 Electrodes

1. Performance Objective

Given two carbon steel plates, one 3/8" x 2" x 6" and one 3/8" x 3 1/2" x 6", welding equipment, fixturing devices, tools and materials, tack weld tee joints.

The tacks will be properly spaced between plates, with sufficient tacks to prevent distortion or warping as per specifications.

Performance Guide

1. Select safety and welding equipment
2. Select clamps, fixtures and tools
3. Set up, align, and clamp work pieces in position
4. Select correct rod and/or electrodes and set up welding machine
5. Tack weld pieces in position

DUTY: Operating Shielded Metallic Arc Welding Equipment

TASK: Set Up And Make Stringer Beads In The Horizontal Position Using E-6010 Electrodes

2. Performance Objective

Given two carbon steel plates, one 3/8" x 2" x 6" and one 3/8" x 3 1/2" x 6" a SMAW machine; set up, align, and tack plates for a tee joint in the horizontal position. Perform this weld on both sides of the tee joint with 1/8" diameter E-6010 electrodes using the whipping technique. Finished welds should be 3/16" to 1/4" equal leg fillet welds with little or no undercut.

Performance Guide

1. Select safety and welding equipment
2. Select two carbon steel plates, one 3/8" x 2" x 6" and one 3/8" x 3 1/2" x 6"
3. Clean as necessary
4. Align plates on flat surface
5. Select correct electrode and set machine
6. Tack weld pieces in position
7. Make horizontal welds

DUTY: Operating Shielded Metallic Arc Welding Equipment

TASK: Set Up And Make A Multi-Pass Weld In The Horizontal Position Using E-6010 Electrodes

3. Performance Objective

Given two plates, one 3/8" x 2" x 6" and one 3/8" x 3 1/2" x 6". a SMAW machine; set up, align, and tack plates for a tee joint in the horizontal position. Perform this weld on both sides with 1/8" diameter E 6010 electrodes using the whipping technique. Finished multi-pass welds should be 5/16" to 3/8" equal leg fillets with little or no undercut.

Performance Guide

1. Select safety and welding equipment
2. Select two plates, one 3/8" x 2" x 6" and one 3/8" x 3 1/2" x 6"
3. Clean as necessary
4. Align plates on flat surface
5. Select correct rod and/or electrodes and set up welding machine
6. Tack weld pieces in position
7. Make horizontal multi-pass welds

DUTY: Operating Shielded Metallic Arc Welding Equipment

TASK: Set Up And Make Stringer Bead Welds In The Vertical Position Using E-6010 Electrodes (Flat Plate)

4. Performance Objective

Given a 3/8" x 3 1/2" x 6" carbon steel plate, a SMAW machine, materials, equipment, and a fixturing device, set up plate in the vertical position in the fixture.

Use 1/8" diameter E-6010 electrodes, weld continuous beads (4 beads 6" long) breaking arc and restarting every two inches and filling crater at the end of each complete bead using the whipping technique. The finished beads should show little evidence of breaking arc and restarting, and crater should be filled to bead height.

Performance Guide

1. Select safety equipment
2. Select tools and materials
3. Set up equipment
4. Clean and position for welding
5. Turn on and adjust welding machine
6. Weld plate according to specifications

DUTY: Operating Shielded Metallic Arc Welding Equipment

TASK: Set Up And Make Stringer Beads In The Vertical Up Position Using E-6010 Electrodes (T-Joint)

5. Performance Objective

Given two carbon steel plates, one 3/8" x 2" x 6" and one 3/8" x 3 1/2" x 6", welding equipment, fixturing devices, tools and materials, tack plates for a tee joint in the vertical up position. Perform this weld on both sides of the tee joint with 1/8" diamater E-6010 electrodes using the whipping technique. Finished welds should be 3/16" to 1/4" equal leg fillet welds with little or no undercut.

Performance Guide

1. Select safety and welding equipment
2. Select two carbon steel plates, one 3/8" x 2" x 6" and one 3/8" x 3 1/2" x 6"
3. Clean as necessary
4. Align plates on flat surface
5. Select correct electrode and set machine
6. Tack weld pieces in position
7. Make vertical up welds

DUTY: Operating Shielded Metallic Arc Welding Equipment

TASK: Set Up And Make A Multi-Pass Weld In The Vertical Up Position Using E-6010 Electrodes

6. Performance Objective

Given two carbon steel plates, one 3/8" x 2" x 6" and one 3/8" x 3 1/2" x 6", a SMAW machine; set up, align, and tack plates for a tee joint in the vertical up position. Perform this weld on both sides with 1/8" diameter E-6010 electrodes using the whipping technique. The first pass will be a stringer bead; next two passes will be weave beads. Finished welds will be 3/8" to 1/2" equal leg fillet welds on both sides, with little or no undercut.

Performance Guide

1. Select safety and welding equipment
2. Select two carbon steel plates, one 3/8" x 2" x 6" and one 3/8" x 3 1/2" x 6"
3. Clean as necessary
4. Align plates on flat surface
5. Select correct electrode and set up welding machine
6. Tack weld pieces in position
7. Make vertical up multi-pass welds

DUTY: Operating Shielded Metallic Arc Welding Equipment

TASK: Set Up And Make Stringer Bead Welds In The Overhead Position Using E-6010 Electrodes (Flat Plate)

7. Performance Objective

Given a 3/8" x 3 1/2" x 6" carbon steel plate, a SMAW machine, materials, equipment and a fixturing device, set up plate in the overhead position in the fixture.

Use 1/8" diameter E 6010 electrodes, weld continuous beads (4 beads 6" long) breaking arc and restarting every two inches and filling crater at the end of each complete bead using the whipping technique.

The finished beads should show little evidence of breaking arc and restarting and crater should be filled to bead height.

Performance Guide

1. Select safety equipment
2. Select tools and materials
3. Set up equipment
4. Clean and position for welding
5. Select correct electrode
6. Adjust welding machine
7. Weld plate according to specifications

DUTY: Operating Shielded Metallic Arc Welding Equipment

TASK: Set Up And Make Stringer Beads In The Overhead Position Using E-6010 Electrodes (T-Joint)

8. Performance Objective

Given a SMAW machine, carbon steel plates, position and tack plates for a tee joint. Perform welds in the overhead position with 1/8" diamater E-6010 electrodes using the whipping technique on both sides of the joint. Visual inspection of welds will show:

a. Smooth and continuous welds
b. 3/16" to 1/4" equal leg fillets
c. No cracks, undercutting or overlap

Performance Guide

1. Select safety equipment
2. Select tools and materials
3. Set up equipment
4. Clean and position for welding
5. Turn on and adjust to above specifications

DUTY: Operating Shielded Metallic Arc Welding Equipment

TASK: Set Up And Make Multi-Pass Welds In The Overhead Position Using E-6010 Electrodes

9. Performance Objective

Given a SMAW machine, carbon steel plates, a fixturing device and materials, position and tack plates for a tee joint. Perform multi-pass welds in the overhead position with 1/8" diameter E-6010 electrodes, run three (3) stringer beads on both sides using the whipping technique. Visual inspection of both sides of the tee joint will show:

a. Smooth and continuous welds
b. 5/16" to 3/8" equal leg fillet welds
c. No cracks, undercutting or overlap

Performance Guide

1. Select safety equipment
2. Select tools and materials
3. Set up equipment
4. Clean and position for welding
5. Turn on and adjust welding machine
6. Weld joints to above specifications

DUTY: Operating Shielded Metallic Arc Welding Equipment

TASK: Set Up And Make Stringer Beads In The Horizontal Position Using E-7018 Electrodes

10. Performance Objective

Given two carbon steel plates, a SMAW machine, set up, align, and tack plates for a tee joint in the horizontal position. Perform this weld on both sides of the tee joint with 1/8" diameter E-7018 electrodes using the free arc technique. Visual inspection of welds will show:

a. Smooth and continuous welds
b. 3/16" to 1/4" equal leg fillet welds
c. No cracking, undercutting, or overlap

Performance Guide

1. Select safety and welding equipment
2. Select tools and materials
3. Set up equipment
4. Clean and position for welding
5. Turn on and adjust welding machine
6. Weld joints to above specifications

DUTY: Operating Shielded Metallic Arc Welding Equipment

TASK: Set Up and Make A Multi-Pass Weld In The Horizontal Position Using E-7018 Electrodes

11. Performance Objective

Given two carbon steel plates, a SMAW machine, set up, align, and tack plates for a tee joint in the horizontal position. Perform this weld on both sides of the tee joint with 1/8" diameter E-7018 electrodes using the free arc technique. Visual inspection of welds will show:

a. Smooth and continuous welds
b. 5/16" to 3/8" equal leg fillet welds
c. No cracking, undercutting or overlap

Performance Guide

1. Select safety and welding equipment
2. Select tools and materials
3. Set up equipment
4. Clean and position for welding
5. Turn on and adjust welding machine
6. Weld joints to above specifications

DUTY: Operating Shielded Metallic Arc Welding Equipment

TASK: Set Up And Make Stringer Bead Welds In The Vertical Position Using E-7018 Electrodes (Flat Plate)

12. Performance Objective

Given a carbon steel plate, 3/8" x 3-1/2" x 6", a SMAW machine, materials, equipment, and a fixturing device, set up plate in the vertical position in the fixture.

Use 1/8" diameter E-7018 electrodes, weld continuous beads (4 beads, 6" long) breaking arc and re-starting every two inches and filling crater at the end of each complete bead using the free arc technique. The finished beads should show little evidence of breaking arc and re-starting, and crater should be filled to bead height.

Performance Guide

1. Select safety equipment
2. Select tools and materials
3. Set up equipment
4. Clean and position for welding
5. Turn on and adjust welding machine
6. Weld plate according to specifications

DUTY: Operating Shielded Metallic Arc Welding Equipment

TASK: Set Up And Make Stringer Beads In The Vertical Position Using E-7018 Electrodes (T-Joint)

13. Performance Objective

Given two carbon steel plates, one 3/8" x 2" x 6" and one 3/8" x 3-1/2" x 6", welding equipment, a fixturing device, tools, and materials, tack plates for a tee joint in the vertical up position. Perform this weld on both sides of the tee joint with 1/8" diameter E-7018 electrodes using the free arc technique. Finished welds should be 3/16" to 1/4" equal leg fillet welds with little or no undercut.

Performance Guide

1. Select safety and welding equipment
2. Select two carbon steel plates to the above dimensions
3. Clean as necessary
4. Select correct electrode and set machine
5. Align plates and tack together
6. Make welds to above specifications

WELDING II

DUTY: Operating Shielded Metallic Arc Welding Equipment

TASK: Set Up And Make A Multi-Pass Weld In The Vertical Up Position Using E-7018 Electrodes

14. Performance Objectives

Given two carbon steel plates, one 3/8" x 2" x 6" and one 3/8" x 3-1/2" x 6", a SMAW machine, set up, align, and tack plates for a tee joint in the vertical up position. Perform this weld on both sides of the tee joint with 1/8" diameter E-7018 electrodes using the free arc and weaving techniques. The next two passes on each side of the tee joint will be weave beads using the Z motion. Visual inspection of welds will show:

a. Smooth and continuous welds
b. 3/8" to 1/2" equal leg fillet welds (checked with a fillet gauge)
c. No cracking, undercutting, or overlap

Performance Guide

1. Select safety and welding equipment
2. Select tools and materials
3. Set up equipment
4. Clean and position for welding
5. Turn on and adjust welding machine
6. Weld joints to the above specifications

DUTY; Operating Shielded Arc Welding Equipment

TASK: Set Up And Make Stringer Bead Welds In The Overhead Position Using E-7018 Electrodes (Flat Plate)

15. Performance Objective

Given a 3/8" x 3-1/2" x 6" carbon steel plate, a SMAW machine, materials, equipment, and a fixturing device, set up plate in the overhead position in the fixture.

Use 1/8" diameter E-7018 electrodes. Weld continuous beads (4 beads 6" long) breaking arc and re-starting every two inches and filling crater at the end of each complete bead using the free arc technique. Visual inspection of the welds will show:

a. Smooth and continuous welds
b. Little evidence of breaking arc and re-starting
c. Crater should be filled to bead height
d. No cracks, undercutting, or overlap

Performance Guide

1. Select safety equipment
2. Select tools and materials
3. Set up equipment
4. Clean and position for welding
5. Select correct electrode
6. Adjust welding machine
7. Weld plate according to specifications

WELDING II

DUTY: Operating Shielded Metallic Arc Welding Equipment

TASK: Set Up And Make Stringer Beads In The Overhead Position Using E-7018 Electrodes (T-Joint)

16. Performance Objective

Given a SMAW machine, carbon steel plates, a fixturing device, and materials, position and tack plates for a tee joint. Perform welds in the overhead position with 1/8" diameter E-7018 electrodes using the free arc technique on both sides of the tee joint.

Visual inspection of welds will show:

a. Smooth and continuous welds
b. 3/16" to 1/4" equal leg fillet welds
c. Little or no sag (overlap) on vertical member of tee joint
d. No cracks or undercut

Performance Guide

1. Select safety equipment
2. Select tools and materials
3. Select two plates, one 3/8" x 2" x 6" and one 3/8" x 3-1/2" x 6"
4. Clean plates and position for a tee joint and tack
5. Turn on and adjust welding machine
6. Weld joints to the above specifications

DUTY: Operating Shielded Metallic Arc Welding Equipment

TASK: Set Up And Make Multi-Pass Welds In The Overhead Position Using E-7018 Electrodes

17. Performance Objective

Given a SMAW machine, carbon steel plates, a fixturing device, and materials, position and tack plates for a tee joint. Perform multi-pass welds in the overhead position with 1/8" diameter E-7018 electrodes, run (3) stringer beads on both sides of the tee joint using the free arc technique.

Visual inspection of welds will show:

a. Smooth and continuous welds
b. 3/8" to 1/2" equal leg fillet welds
c. Little or no sag (overlap) on vertical member of tee joint
d. No cracks or undercut

Performance Guide

1. Select safety equipment
2. Select tools and materials
3. Select two plates, one 3/8" x 2" x 6" and one 3/8" x 3-1/2" x 6"
4. Clean plates and position for a tee joint and tack together
5. Turn on and adjust welding machine
6. Weld joints to above specifications

STANDARDS OF ACHIEVEMENT AND GRADING

STANDARDS OF ACHIEVEMENT & GRADING

Within the framework of this competency-based Welding II course, one of four possible grades is assigned to the student at the end of the term. The four grades are A, B, C, and I (Incomplete).

The following three (3) pages are guides to be used by the instructor for assigning A, B, or C based on his evaluation of the critical areas of welding as the completed duties and tasks are completed by the student.

A grade of I (Incomplete) is to be assigned to any student not satisfactorily completing the duties and tasks and the written examination. Students who have numerous incomplete duties and tasks should be encouraged to re-register for Welding II the following semester.

A student who does not intend to complete the duties and tasks and does not want college credit for the course should be advised to audit the course. By doing so, the student is essentially taking the course on a non-credit basis. The student should be made aware of this possibility and inform the instructor of his decision at the beginning of the term.

SUPPLEMENT TO STANDARDS OF ACHIEVEMENT

Under Criterion of Evaluation (page 2) to ascertain a grade level from A to C.

"A" Student

1. a. Stringer beads -- There would be no variation.
   b. Fillet welds -- The contour of face is good depending on electrode type. Size of legs do not vary above or below the recommended lead size.

2. Starting a weld --- Starts good 100% of the time.

3. Uniform flux lines -- Spacing and shaping are good -- does not vary.

4. Tie-ins ------- Does not have a high buildup.

5. End of weld ----- Does not leave excessive metal buildup at end of crater. Never oversized.

6. Undercut ------- No undercut or overlap.

7. Excessive spatter -- Arc length and amperage setting proper all of the time.

8. Dirty welds ----- All clean welds.

SUPPLEMENT TO STANDARDS OF ACHIEVEMENT

Under Criterion of Evaluation (page 2) to ascertain a level from "A" to "C".

"B" Student

1.	a. Stringer beads - -	There will be little or no variation.
	b. Fillet welds - - -	The contour of face is good depending on electrode type. Size of legs may vary 1/16" or less above or below the recommended lead size.
2.	Starting a weld - - -	Starts good 90% of the time.
3.	Uniform flux lines - -	Spacing and shaping are good -- may vary on occasion. (A "B" student would make 4 out of 5 good lines).
4.	Tie-ins - - - - - - - -	May have a high buildup sometimes, but still a good restart and on occasion, make a perfect restart.
5.	End of weld - - - - -	May leave excessive metal buildup at end of crater but never oversize.
6.	Undercut - - - - - - -	Very little, if any undercut -- maybe a slight trace of overlap on occasion.
7.	Excessive spatter - -	Arc length and amperage setting proper most of the time.
8.	Dirty welds - - - - -	No dirty welds.

SUPPLEMENT TO STANDARDS OF ACHIEVEMENT

Under Criterion of Evaluation (page 2) to ascertain a grade level from "A" to "C".

"C" Student

1. a. Stringer beads - - The height and width may vary from bead to bead, but it would still be in the tolerance of acceptability.

   b. Fillet weld - - - They will vary from bead to bead also with the leg size slightly smaller or larger and the contour of the face changing slightly from bead to bead.

2. Starting a weld - - - They may be higher or wider or narrower, but also acceptable.

3. Flux lines - - - - - - Some rounded shapes and arrow shapes. The spacing would vary with speed or placement of the electrode in the puddle.

4. Tie-ins - - - - - - - Some tie-ins overlap crater properly or overlap too far.

5. End of weld - - - - - The crater not quite filled or overfilled.

6. Undercut - - - - - - - Slight undercut is okay within an acceptable tolerance and may be some overlap.

7. Excessive spatter - - Fluctuating arc length and amperage setting.

8. Dirty welds - - - - - Weld not always clean.

STUDENT RECORDS

STUDENT RECORDS

There are two basic forms and records to be kept by the instructor. The forms are as follows:

1. Student Record Class Roster

   This form is to be used by the instructor to record the date completed and the grade received by the student on each task.

2. Student Proficiency Record

   Each welding laboratory will contain a file of student folders which will contain a proficiency record for each student. As the student completes each task, the instructor is to record the date completed and to certify the date and competency by signing in the appropriate space.

WELDING II - 72102 - COMMUNITY COLLEGE OF ALLEGHENY COUNTY - CENTER-NORTH

STUDENT NAME_____ SOCIAL SECURITY NO._____

This is to certify that the above named student has demonstrated proficiency in the following tasks:

Competency Task	Completed	Instructor
1. Set up and tack plates for T-Joint in the horizontal position using E-6010 electrodes.		
2. Set up and make stringer beads in the horizontal position using E-6010 electrodes.		
3. Set up and make a multi-pass weld in the horizontal position using E-6010 electrodes.		
4. Set up and make stringer bead welds in the vertical up position using E-6010 electrodes. (Flat Plate)		
5. Set up and make stringer beads in the vertical up position using E-6010 electrodes. (T-Joint)		
6. Set up and make a multi-pass weld in the vertical up position using E-6010 electrodes.		
7. Set up and make stringer bead welds in the overhead position using E-6010 electrodes. (Flat Plate)		
8. Set up and make stringer beads in the overhead position using E-6010 electrodes. (T-Joint)		
9. Set up and make multi-pass welds in the overhead position using E-6010 electrodes.		
TEST		
10. Set up and make stringer beads in the horizontal position using E-7018 electrodes.		
11. Set up and make a multi-pass weld in the horizontal position using E-7018 electrodes.		

Competency Task	Completed	Instructor
12. Set up and make stringer bead welds in the vertical up position using E-7018 electrodes. (Flat Plate)		
13. Set up and make stringer beads in the vertical up position using E-7018 electrodes. (T-Joint)		
14. Set up and make a multi-pass weld in the vertical up position using E-7018 electrodes.		
15. Set up and make stringer bead welds in the overhead position using E-7018 electrodes. (Flat Plate)		
16. Set up and make stringer beads in the overhead position using E-7018 electrodes. (T-Joint)		
17. Set up and make multi-pass welds in the overhead position using E-7018 electrodes.		
FINAL EXAM		

WELDING II 72-102

STUDENT RECORD CLASS ROSTER

DATE

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1.	Fit - Tack - T-Joint, Horizontal, E-6010														
2.	Stringer, Horizontal, E-6010														
3.	Multi-pass, Horizontal, E-6010														
4.	Stringer Bead, Vertical, E-6010														
5.	Stringer, Vertical, T-Joint, E-6010														
6.	Multi-pass, Vertical, E-6010														
7.	Stringer Bead, Overhead, E-6010														
8.	Stringer, Overhead, T-Joint, E-6010														
9.	Multi-pass, Overhead, E-6010														
	Test														
10.	Stringer Bead, Horizontal, E-7018														
11.	Multi-pass, Horizontal, E-7018														
12.	Stringer Bead, Vertical, E-7018														
13.	Stringer, Vertical, T-Joint, E-7018														
14.	Multi-pass, Vertical, E-7018														
15.	Stringer Bead, Overhead, E-7018														
16.	Stringer, Overhead, T-Joint, E-7018														
17.	Multi-pass, Overhead, E-7018														
	Final Exam														

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